International Currency and the US Current Account Deficits*

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Abstract

The purpose of this paper is to provide some theoretical and empirical supports to the view that a remarkable change in international capital flows would help to explain recent increases in the U.S. current account deficits. In the first part, we provide a simple open economy model where an increased motive for liquid foreign assets can cause large current account surpluses against the country that issues an international currency. The dynamic analysis reveals that the current account surpluses are likely to remain large for long years, accompanied by substantial depreciation of the real exchange rate against the international currency. In the second part, we provide several empirical supports to the theoretical implications. We first show that there were not only large increases in foreign exchange reserves in East Asian economies but also substantial depreciation of East Asian real exchange rates against the U.S. dollar even after the economies recovered from the crisis. We then provide noteworthy regressions based on the Balassa-Samuelson model. We observe world-wide undervaluation of real exchange rates against the U.S. dollar after the Asian crisis. The degree of undervaluation was more conspicuous among the East Asian economies. Our results support the view that the U.S. current account deficit is not "made in the U.S.A." but is attributable to some events external to the United States.

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1. Introduction

In recent literature, it has been widely discussed why the U.S. current account has deteriorated dramatically during the past decade. Although the U.S. current account had been in deficit for most of the periods in the 1980s and the 1990s, its deficits had been almost balanced by Japan's current account surpluses until the mid 1990s. However, the U.S. current account started to show a dramatic deterioration after 1997 and is now far from balanced by surpluses of the other industrialized countries (see Figure 1). The U.S. national saving is currently very low and falls considerably short of domestic capital investment. Of necessity, this shortfall is made up by net foreign borrowing. Why is the United States borrowing so heavily in international capital markets? The first strand of studies proposes that the recent deterioration in the U.S. current account primarily reflects economic policies and other economic developments within the United States itself. They emphasize the role of low U.S. saving and often conclude that the U.S. current account deficit is "made in the U.S.A." and is independent of developments in other parts of the world. However, linking current-account developments to the decline in saving raises another question of why U.S. saving has declined. In particular, although the decline in U.S. saving may reflect changes in household behavior or economic policy in the United States, it may also be in some part a reaction to external events outside the United States. The second strand of studies focuses on this reaction and points out that a significant increase in the global supply of saving would help to explain the increase in the U.S. current account deficit. In particular, these studies stress a remarkable reversal in global capital flows that has transformed emerging-market economies from borrowers to large net lenders in international capital markets (see, for example, Bernanke (2005)).

The purpose of this paper is to provide some theoretical and empirical supports to the second strand of studies. We particularly focus on changes in international capital flows in East Asian economies after the currency crisis in 1997. During the crisis, countries with smaller liquid foreign assets had hard time in preventing panics in financial markets and sudden reversals in capital flows (see, for example, Corsetti, Pesenti, and Roubini (1999) and Sachs and Radelet (1998)). Many developing countries thus came to recognize that increased liquidity is an important self-protection against crises (see, for example, Aizenman and Lee (2005) and Rodrik (2005)). In particular, because of the role of the U.S. dollar as an international currency, it became indispensable for developing countries to accumulate the U.S. government bonds that would make crises less likely. Consequently, after the crisis, the increased preference for international liquidity allowed a large proportion of the U.S. current account deficit to be financed by developing countries, especially East Asian economies.

In the first part of this paper, we provide a simple open economy model where an increased motive for liquid foreign assets can cause large current account surpluses against the country that issues an international currency. In the model, each representative agent maximizes the utility

function over time. A key feature is that net foreign assets are in the utility function. In particular, we assume that holding the international currency induces larger utility. At period 0, there is an unanticipated shock that increases preference for holding the international currency. In the dynamic analysis, large current account surpluses arise only in a saddle point path that converges to the new steady state. However, under some reasonable parameter set, the speed of convergence is very slow. The current account surpluses are thus likely to remain large for long years, accompanied by substantial depreciation of the real exchange rate against the international currency.

In the second part of the paper, we provide several empirical supports to the theoretical implications. First, we show that there were not only record-breaking increases in foreign exchange reserves in East Asian economies but also substantial depreciation of East Asian real exchange rates against the U.S. dollar even after the economies recovered from the crisis. We also show that trade account surpluses have been widening against the United States but not against non-US countries in several Asian economies. Following Rogoff (1996), we then provide noteworthy regressions based on the Balassa-Samuelson model. We observe world-wide undervaluation of real exchange rates against the U.S. dollar after the Asian crisis. The degree of undervaluation was particularly conspicuous among the East Asian economies. However, we see less conspicuous undervaluation against the Deutsche Mark or the Japanese Yen after the Asian crisis. Given technological shocks, large current account deficits would naturally tend to lead to currency depreciation in a world of floating exchange rates. Our results based on the Balassa-Samuelson model support the view that the U.S. current account deficit is not "made in the U.S.A." but is attributable to some events external to the United States.

2. A Small Open Economy Model

The main purpose of our theoretical model is to investigate macroeconomic consequences when the economy suddenly increased its preference for holding a liquid foreign asset. We consider a small open economy that produces two composite goods, tradables and nontradables. For analytical simplicity, we assume that outputs of tradables and nontradables, y^T and y^N, are fixed and constant overtime. Each representative agent in the economy maximizes the following utility function:

$$(1)\quad \sum_{j=0}^{\infty} \beta^j \left[(c^T_{t+j})^{\alpha} (c^N_{t+j})^{1-\alpha} + \lambda\, ln(b^A_{t+j}) + \rho\, ln(b^B_{t+j})\right], \qquad 0 < \alpha < 1 \text{ and } \lambda > \rho > 0,$$

where c^T_t = consumption of tradable good, c^N_t = consumption of nontradable good, b^A_t = net

holdings of country A's assets, b^B_t = net holdings of country B's assets, and β is a discount factor such that $0 < \beta < 1$. Subscript *t* denotes time period. The utility function represents the case where an elasticity of substitution in consumption between the tradable good and the nontradable good equals to one.

The budget constraint of the representative agent is

$$(2) \quad b^A_{t+1} + b^B_{t+1} = (1+r)\, b^A_t + (1+r)\, b^B_t + y^T + p^N_t y^N - c^T_t - p^N_t c^N_t.$$

where p^N_t is the price of nontradable good and *r* is world real interest rate. For simplicity, we assume that two foreign assets have the same real interest rate such that $r < (1/\beta) - 1$. Since the numeraire is the traded good, the real interest rates and the price of nontradable good are defined in terms of tradables.

A key feature in our model is that net foreign assets are in the utility function. This is one of the simplest forms that capture special benefits from holding liquid foreign assets. Countries with higher (net) levels of liquid foreign assets are better able to prevent panics in financial markets and sudden reversals in capital flows. Therefore they may increase utility through reducing potential costs of financial crises. For simplicity, we assume that the representative agent holds two foreign assets. One is b^A_t and the other is b^B_t. Both of the net foreign assets are in the utility function. However, since $\lambda > \rho > 0$, net holdings of country A's assets induce higher utility than net holdings of country B's assets. One may interpret that the country A's assets are US treasury bonds that play a special role of international reserve currency.

The first-order conditions are derived by maximizing the following Lagrangian:

$$(3) \quad L = \sum_{j=0}^{\infty} \beta^j \left[(c^T_{t+j})^{\alpha} (c^N_{t+j})^{1-\alpha} + \lambda\, ln(b^A_{t+j}) + \rho\, ln(b^B_{t+j})\right]$$

$$- \sum_{j=0}^{\infty} \beta^j\, \mu_{t+j} \left[b^A_{t+1+j} + b^B_{t+1+j} - (1+r)\, b^A_{t+j} - (1+r)\, b^B_{t+j} - y^T - p^N_{t+j} y^N + c^T_{t+j} + p^N_{t+j} c^N_{t+j}\right].$$

Since $c^N_t = y^N$ in equilibrium, the first-order conditions lead to

$$(4a) \quad p^N_t = [(1-\alpha)/\alpha]\, c^T_t / y^N,$$
$$(4b) \quad \alpha (y^N / c^T_t)^{1-\alpha} = \mu_t,$$
$$(4c) \quad \beta\lambda / b^A_{t+1} = \beta\rho / b^B_{t+1} = \mu_t - (1+r)\, \beta\, \mu_{t+1}.$$
$$(4d) \quad b^A_{t+1} + b^B_{t+1} = (1+r)\, (b^A_t + b^B_t) + y^T - c^T_t.$$

Since $b^A_{t+1} + b^B_{t+1}$ is the total value of the economy's net foreign assets at the end of a period *t*,

the economy's total current account balance over period t is defined by

$$(5) \quad CA_t \equiv (b^A_{t+1} + b^B_{t+1}) - (b^A_t + b^B_t) = r\,(b^A_t + b^B_t) + y^T - c^T_t.$$

Similarly, the economy's bilateral current account balance against country j (j = A, B) is defined by

$$(6) \quad CA^j_t \equiv b^j_{t+1} - b^j_t, \qquad \text{for j = A, B.}$$

Since the numeraire is the traded good, the consumption-based price index is $P_t = (1)^{\alpha}(p^N_t)^{1-\alpha} = (p^N_t)^{1-\alpha}$ for the utility function (1). Therefore, the price of nontradable good p^N_t denotes the real exchange rate of this small open economy at time t, where a decline of p^N_t means depreciation of the real exchange rate. Equation (4a) implies that the real exchange rate depreciates when c^T_t declines.

3. Dynamic Analysis

(1) The Steady State

In the steady state, $b^A_t = b^A$, $b^B_t = b^B$, $p^N_t = p^N$, $c^T_t = c^T$, and $\mu_t = \mu$. By using equations (4a) – (4d), the steady state equilibrium in our model is therefore described by

$$(7a) \quad b^A = \lambda A (c^T)^{1-\alpha},$$
$$(7b) \quad b^B = \rho A (c^T)^{1-\alpha},$$
$$(7c) \quad p^N = [(1-\alpha)/\alpha]\,(1/y^N)\,c^T,$$
$$(7d) \quad c^T - (\lambda+\rho)\,r A (c^T)^{1-\alpha} = y^T.$$

where $A \equiv \beta/[\alpha\{1 - (1+r)\beta\}(y^N)^{1-\alpha}]$. In the steady state, the economy's current account is always balanced not only in total but also bilaterally, that is, $CA = CA^A = CA^B = 0$.

Since (7d) leads that $\Delta c^T/\Delta y^T = 1/\{\alpha+(1-\alpha)(y^T/c^T)\} > 0$, it holds that $\Delta p^N/\Delta y^T = (1/y^N)(\Delta c^T/\Delta y^T) > 0$. The comparative statics implies that a positive productivity shock in the tradable sector appreciates the real exchange rate of the economy. This is a simplified version of the Balassa-Samuelson effect that shows a tendency for countries with higher productivity in tradables compared with nontradables to have higher price levels.[1] We can verify that the result is true not only in the long-run but also in the transition path to the new steady state.

[1] There is abundant empirical evidence that prices of non-traded goods, and thereby of general price levels, rise with levels of productivity, real wages and real income. The standard Balassa-Samuelson effect stresses the role of labor mobility between tradable and nontradable sectors. For simplicity, we neglected this mechanism in our model.

From (7d), it also holds that $\Delta c^T/\Delta\lambda = r\ A(1-\alpha)\ (c^T)^{1-\alpha}/\{\alpha+(1-\alpha)(y^T/c^T)\} > 0$. We therefore obtain that $\Delta p^N/\Delta\lambda = (1/y^N)(\Delta c^T/\Delta y^T) > 0$, $\Delta b^A/\Delta\lambda = A\ (c^T)^{1-\alpha} + (1-\alpha)\lambda\ A\ (c^T)^{-\alpha}(\Delta c^T/\Delta y^T) > 0$, and $\Delta b^B/\Delta\lambda = (1-\alpha)\rho\ A\ (c^T)^{-\alpha}(\Delta c^T/\Delta y^T) > 0$. The inequalities imply that an unanticipated increase of preference for b^A increases consumption of tradable good and leads to the appreciation of the real exchange rate in the long-run. However, as for the impacts of the unanticipated change of λ, the short-run impacts are very different from the long-run impacts.

(2) Transition Path

What is practically more important is to investigate short-run and intermediate consequences after the economy suddenly increased its preference for holding a liquid foreign asset. To achieve this goal, we explore what impacts an unanticipated change of λ has during the transiton path to the new steady state. We set the structural parameters as $\alpha = 0.5$, $\beta = 0.95$, $r = 0.02$, and $\rho = 1$ and domestic outputs as $y^T = y^N = 10$. These parameters and outputs remain constant throughout the period. We assume that the economy remained in the steady state before period 0. However, at period 0, there was a very big unanticipated preference shock in holding country A's assets and the value of λ increassed from 5 to 6 permanently. The dynamic path after period 0 then follows a saddle point path that converges to the new steady state in the long-run.

Figure 2 depicts the dynamic paths of consumption of tradable good c^T and real exchange rate p^N. It is easy to see that the short-run impacts on c^T and p^N are completely opposite to the long-run impacts. The consumption of tradable good declines by about 10% at period 0 and then gradually increases after that. The recovery speed of the consumption is, however, very slow. It takes nearly 35 periods to recover the initial level. Even after 60 periods passed, the level of the consumption is still far below its steady state value.[2] Since $\beta = 0.95$ and $r = 0.02$ in our parameter set, it is natural to suppose that the time span is annual in the figure. The short-run dynamic path therefore indicates that after the very big unanticipated preference shock, the economy reduces its consumption substantially for long years.

Similarly, the real exchange rate substantially depreciates at period 0 and then gradually appreciates after period 1. Soon after the large shock, the depreciation rate of the real exchange rate is about 10% and it takes nearly 35 periods to recover the initial level. The strong preference for the foreign assets dramatically increases the demand for the foreign currency and makes the value of home currency substantially low in the short-run. It takes long years for the economy to recover from the initial impact.

Figure 3 depicts the dynamic paths of total currency account (CA), current account against country A (CA^A), and current account against country B (CA^B). The total currency account shows a substantial appreciation at period 1 and keeps big surpluses for a long period. The initial surplus is

[2] The new steady state value is about 23.02 for our parameter set and output levels.

about 25% of domestic output of tradable good. The surplus gradually declines over time after period 2. But even at period 30, it is about 15% of domestic output of tradable good.

As for the bilateral current accounts, there is a dramatic increase of CA^A at period 1. This happens partly because of a decline of consumption of tradable good but mostly because of a dramatic decline of b^B. At period 1, there is a substantial portfolio rebalance from b^B_t to b^A_t. Soon after the big preference shock, the economy not only increases its saving rate but also substitutes net holdings of country B's assets by net holdings of country A's assets dramatically. Consequently, CA^B shows temporal but dramatic deterioration. The increase of total currency account is therefore less dramatic than CA^A at period 1. The current account surplus against country A becomes modest after period 2. But even after period 2, it remains very high, taking 20% of domestic output of tradables until period 10 and 10% until period 40. In contrast, the current account against country B, which temporarily becomes in deficit at period 1, turns positive after period 2. It remains to be positive after that, but the amount of its surpluses is very small.

4. Some Empirical Evidence in East Asia

After the Asian crisis, most Asian economies came to recognize that economic growth that relies on external borrowings is not desirable, given their vulnerability to a sudden reversal of capital flows. Soon after the crisis, they thus started to run large current account surpluses to increase liquidity as an important self-protection against crises. Among the strategies for the self-protection, raising foreign reserves is the one advice that most Asian economies have taken seriously. Foreign exchange reserves held by developing nations, especially East Asian economies, are now record-breaking, and stand at levels that are a multiple of those held by advanced countries. Table 1 reports the ratios of foreign exchange reserves to GDP for ten East Asian economies (Japan, China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore, Thailand, and Taiwan) from 1990 to 2004. It shows that the ratios are now over 10% in all East Asian economies and over 20% except for Japan, Indonesia, and the Philippines.

Unfortunately, each government keeps the currency composition of the foreign exchange reserves a well-guarded secret. But IMF annual report provides average currency composition for industrialized countries and developing countries every year. In addition, Tavlas and Ozeki (1991) reported average currency composition for selected Asian countries in the 1980s.[3] Table 2 summarizes the reported currency compositions. The shares of the U.S. dollar have been high in both industrialized and developing countries. In particular, the shares of the U.S. dollar in developing countries were close to 70% from 1991 to 2001. Although updated data is not

[3] Tavlas and Ozeki (1991) did not clarify which countries they included in their selected Asian countries. China is likely to be excluded in their estimates.

available for the selected Asian countries, almost half of these reserves are likely to have been invested in the United Sates, typically U.S. treasuries or other safe U.S. safe assets.

Some comparable data sets are also available from the U.S. side. The U.S. Treasury does have estimates of major foreign holders of treasury securities holdings from 2000 to 2005. Table 3 summarizes the estimates for Japan, China, Korea, Taiwan, Hong Kong, Singapore, and Thailand. The changes of treasury securities holdings were modest in Hong Kong, Singapore, and Thailand. However, there were dramatic increases of treasury securities holdings in China and Japan. The amount of treasury securities holdings was more than doubled in Korea and Taiwan from 2000 to 2005. Although the data includes both official and private holdings, it is more likely that recent increases in central bank reserves account for a large share of those assets. The reserves, which are typically held in the form of U.S. Treasury bills and agency bonds, pay a low rate of return. It is less likely that private investors accumulated such assets of low interest rates.

Given other conditions, large current account surpluses would naturally lead to currency appreciation in a world of floating exchange rates. However, when the economy increases the demand for foreign reserves to increase liquidity, large current account surpluses could persist for long years accompanied by the real exchange rate depreciation. This is particularly true for current account surplus against the United States the currency of which has been widely held as an international reserve currency. Figure 4 reports real exchange rates of eight East Asian economies from 1990 to 2004. In the figure, lower values mean depreciation. It shows that except for China, the real exchange rates depreciated substantially against the U.S. dollar after the crisis and remained low even after the economies recovered from the crisis. The rate of depreciation from 1996 to 2004 is more than 20% in Korea, Thailand, Malaysia, and the Philippines.

It can be argued that the rapid rise in reserves in recent years has little to do with the self-insurance motive, but is instead related to policymaker's desire to prevent the appreciation of their currencies and maintain the competitiveness of their tradable sectors (see, for example, Roubini and Setser (2004)). If this is the case, many Asian economies have intervened aggressively in the foreign exchange market to maintain large current account surpluses without the appreciation of their currencies. The aggressive intervention could maintain the competitiveness of their tradable sectors and manifest itself in the massive accumulation of foreign reserves by Asian central banks. The argument may be relevant in explaining China's reserve accumulation, where *de facto* dollar peg had been maintained for a long time. It may explain some of recent reserve accumulation in the other East Asian economies. However, it is worthwhile to note that trade account surpluses have been widening only against the United States in most Asian economies.

Table 4 reports total trade balances of eight East Asian economies from 1990 to 2004. It also reports their trade balances against the United States and the other trade partners. It shows that

except for Hong Kong and the Philippines, the East Asian economies had trade balance surpluses in total after the crisis. In particular, except for the Philippines, they had big trade balance surpluses against the United States after the crisis. However, several East Asian economies frequently ran trade balance deficits against the other countries even after the crisis. For example, Korea's trade balance against the non-U.S. countries was in deficit in 2001 and 2002. Both China and Thailand have run deficit against the non-U.S. countries since 2000. The results suggest that we need a special explanation of why the East Asian economies widened their trade account surpluses only against the United States after the crisis.

5. The Balassa-Samuelson Relationship

In previous literature, Purchasing Power Parity (PPP) is often calculated as a guide for what the equilibrium level of the real exchange rate. But estimates of relative PPP do not necessarily show whether the exchange rate is overvalued or undervalued because they use the past as the benchmark. Therefore, the changes of real exchange rates such as those in Figure 4 do not necessarily imply that the real exchange rates of East Asian economies have been undervalued after the crisis. The purpose of this section is to use absolute PPP data to evaluate the real exchange rates after the crisis.

In general, comparisons of price levels across countries are difficult because absolute PPP data are much less available than relative PPP data. But the latest version of the Penn World Table (PWT) provides absolute PPP data until 2000. The PWT endeavors to compare, in levels, the U.S. dollar prices of identical, quality-adjusted output baskets for a large sample of countries. By using the PWT, Rogoff (1996) found a clear positive association between relative price levels and real incomes. The simple logarithmic equation he estimated over the 100 observations is as follows.

$$(8) \quad \log P_j/P_{U.S.} = \text{constant} + a \cdot \log Y_j/Y_{U.S.},$$

where $P_j/P_{U.S.}$ is the price level of country j relative to the United States, and $Y_j/Y_{U.S.}$ is country j's relative income level to the United States. The Rogoff's regression implies that fast-growing countries will tend to see their real exchange rates appreciate and vice versa for slow-growing countries. This robust empirical regularity is called the Balassa-Samuelson effect, and is most often explained by the assumption that productivity growth is more rapid in traded goods than non-traded goods.

By using the panel data of the PWT from 1990 to 2000, we estimate the Rogoff's regression. However, in our estimation, we include the post-crisis dummy and the East Asian dummy to equation (8). The post-crisis dummy is a time dummy that takes one from 1998 to 2000 and zero

otherwise. The post-crisis East Asian dummy is an East Asian regional dummy times a post-crisis dummy that takes one from 1999 to 2000 only for eight Asian economies (China, Hong Kong, Indonesia, Korea, Malaysia, the Philippines, Singapore, and Thailand) and zero otherwise. We started the post-crisis East Asian dummy from 1999 because the East Asian economies were still unstable in 1998. Except for Indonesia, the East Asian economies showed remarkable recovery after 1999. Because former centrally planned countries and post-crisis Indonesia can be outliers, we also include the China dummy, the East Europe dummy, and the post-crisis Indonesia dummy in some regressions. The China dummy or the East Europe dummy takes one from 1999 to 2000 for China or East Europe countries and zero otherwise. The post-crisis Indonesia dummy takes one from 1998 to 2000 for Indonesia and zero otherwise.

Table 5 reports the results of our regressions with and without two former centrally planned economy dummies. Like the Rogoff's result, the coefficient of the relative income level always takes significantly positive, showing a clear positive association between relative price levels and real incomes. However, the coefficients of the two time dummy variables are significantly negative. The negative coefficient of the post-crisis dummy implies that there was worldwide undervaluation of real exchange rates against the U.S. dollar after the crisis. The negative coefficient of the post-crisis East Asian dummy implies that the degree of the undervaluation of the real exchange rates was more conspicuous among the East Asian economies after the Asian crisis. The result is consistent with the view that East Asian economies increased the demand for the U.S. dollar to increase liquidity after the crisis and consequently had large current account surpluses accompanied by the real exchange rate depreciation.

The result did not change even if we include the China dummy and the East Europe dummy. Both of the dummies had significantly negative coefficients. The negative coefficient of the China dummy implies that the Chinese Yuan had been undervalued throughout the 1990s. It reconfirms the conclusion of Frankel (2005) that China's prices have been well below the level that one would predict from the Balassa-Samuelson equation. However, when we include the post-crisis Indonesia dummy, the impact of the post-crisis East Asian dummy becomes less significant. Except for Indonesia, the undervaluation of East Asian real exchange rates may not be so far from the worldwide undervaluation after the crisis.

6. The Real Exchange Rates against Germany and Japan

In the last section, we provided some regressions based on the Balassa-Samuelson model and showed that there was world-wide undervaluation of real exchange rates against the U.S. dollar after the Asian crisis. In particular, we found that the degree of undervaluation was particularly conspicuous among the East Asian economies. The purpose of this section is to explore robustness

of the results by using Germany or Japan as an alternative benchmark country. The Rogoff's regression would support the Balassa-Samuelson effect regardless of the choice of the benchmark country. However, to the extent that the real exchange rates became undervalued only against the U.S. dollar, the impacts of the time dummy variables would be different when we use different industrialized countries as benchmark countries.

We estimate the following equation with dummy variables.

(9) $\log P_j/P_K = \text{constant} + b \cdot \log Y_j/Y_K$,

where P_j/P_K is the price level of country j relative to country K, and Y_j/Y_K is country j's relative income level to country K (K = Germany or Japan). Except for the benchmark country, the logarithmic equation (9) is the same as (8). The Balassa-Samuelson effect therefore predicts a clear positive association between relative price levels and real incomes in (9).

Table 6 reports the results of our modified regressions. As in Table 5, the coefficient of the relative income level always takes significantly positive. The Balassa-Samuelson effect is robustly supported regardless of the choice of the benchmark country. However, the impacts of the two time dummy variables become very different when we use Germany as a benchmark country. The coefficient of the post-crisis dummy turned significantly positive. This implies that worldwide real exchange rates became overvalued against the Deutsche Mark after the crisis. Except when we include the post-crisis Indonesia dummy, the coefficient of the East Asian dummy is still negative even when we use Germany as a benchmark country. But given that the post-crisis dummy had a positive coefficient, the degree of total undervaluation of the East Asian real exchange rates against the Deutsche Mark was much smaller than against the U.S. dollar after the Asian crisis. These results are consistent with the view that the role of the U.S. dollar as an international currency is crucial to understand remarkable changes in international capital flows after the crisis and that the increased preference for international liquidity allowed a large proportion of the U.S. current account deficit to be financed by developing countries, especially East Asian economies.

When we use Japan as a benchmark country, the results are less conclusive. The coefficient of the post-crisis dummy became insignificant. This implies that worldwide real exchange rates showed no significant structural change against the Japanese Yen after the crisis. But except when we include the post-crisis Indonesia dummy, the coefficient of the East Asian dummy took substantial negative values. Even allowing the insignificant impact of the post-crisis dummy, the degree of total undervaluation of the East Asian real exchange rates against the Japanese Yen was almost as large as against the U.S. dollar after the Asian crisis. We probably need another story of why the East Asian real exchange rates depreciated against the Japanese Yen after the crisis.

7. Concluding Remarks

This paper provided some theoretical and empirical supports to the view that a remarkable change in international capital flows would help to explain recent increases in the U.S. current account deficits. We particularly focused on a remarkable change in international capital flows in East Asian economies. During the last decade, financial globalization has been accompanied by frequent and painful financial crises. Some of the well-known crises include Mexico in 1995, East Asia in 1997, Russia in 1998, Brazil in 1999, and Argentina in 2002. During the crises, countries with smaller liquid foreign assets had hard time in preventing panics in financial markets and sudden reversals in capital flows. Many developing countries thus came to recognize that increased liquidity is an important self-protection against crises. In particular, because of the role of the U.S. dollar as an international currency, it became indispensable for them to accumulate the U.S. government bonds that would make crises less likely. Consequently, after the crisis, the increased preference for international liquidity allowed a large proportion of the U.S. current account deficit to be financed by developing countries, especially East Asian economies. By virtue of the U.S. dollar's position as an international currency, the United Sates has been able to borrow from abroad at low rates.

The conclusion of this paper does not necessarily deny alternative views in explaining recent increases in the U.S. current account deficits. One may argue that the recent deterioration in the U.S. current account primarily reflects economic policies and other economic developments within the United States itself. One popular argument for the "made in the U.S.A." explanation of the rising current account deficit focuses on the burgeoning U.S. federal budget deficit. That inadequate U.S. national saving is the source of declining national saving and the current account deficit must be true at some level. However, the so-called twin-deficits hypothesis, that government budget deficits cause current account deficits, does not account for the fact that the U.S. external deficit expanded by about $300 billion between 1996 and 2000, a period during which the federal budget was in surplus and projected to remain so. It seems unlikely, therefore, that changes in the U.S. government budget position can entirely explain the behavior of the U.S. current account over the past decade.

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Table 1. The Ratios of Foreign Exchange Reserves to GDP in East Asia

(%)

	Japan	China	Hong Kon	Indonesia	Korea	Malaysia	Philippines	Singapole	Thailand	Taiwan
1990	2.7	9.7	32.8	7.0	5.8	22.8	2.1	76.0	15.6	45.2
1991	2.2	12.6	33.5	8.0	4.7	23.1	7.2	80.7	17.8	45.9
1992	2.0	5.6	35.0	8.3	5.6	29.9	8.3	82.2	18.3	38.8
1993	2.3	5.5	36.4	7.1	5.6	40.7	8.6	82.9	19.6	37.3
1994	2.6	9.8	37.0	6.9	6.1	34.1	9.4	82.4	20.3	37.8
1995	3.5	10.8	39.1	6.8	6.3	26.8	8.6	81.8	21.4	34.1
1996	4.6	13.0	40.8	8.0	6.1	26.8	12.1	83.4	20.7	31.5
1997	5.1	15.8	53.4	7.7	3.9	20.8	8.9	74.7	17.3	28.8
1998	5.5	15.6	54.2	23.8	15.0	35.4	14.2	91.3	25.8	33.8
1999	6.4	15.8	59.9	18.9	16.6	38.6	17.4	93.1	27.8	36.9
2000	7.5	15.6	65.1	17.3	18.8	32.7	17.2	86.6	26.1	34.4
2001	9.5	18.1	68.3	16.6	21.3	34.6	18.9	87.8	28.0	43.7
2002	11.6	22.3	69.9	15.5	22.2	36.0	17.7	92.7	30.0	57.4
2003	15.4	27.8	76.3	14.7	25.5	42.9	17.6	103.7	28.7	72.2
2004	17.9	37.3	75.8	13.6	29.3	56.4	15.5	105.1	29.8	79.2

Data Sources) Except for Taiwan, International Financial Statistics, IMF. For Taiwan, Key Indicators, ADB.

Table 2. Official Holdings of Foreign Exchange

(%)

	1980	1984	1989	1994	1999	2004
U.S. dollar						
Industrial countries	54.3	57.0	48.4	51.2	73.5	71.5
Developing countries	58.1	57.0	60.5	61.8	68.2	59.9
Selected Asian countries	48.6	58.2	56.4	n.a.	n.a.	n.a.
Japanese yen						
Industrial countries	2.1	5.3	7.5	8.3	6.7	3.6
Developing countries	4.9	4.1	6.9	8.2	6.0	4.3
Selected Asian countries	13.9	16.3	17.5	n.a.	n.a.	n.a.
Pound sterling						
Industrial countries	0.5	1.4	1.2	2.3	2.2	1.9
Developing countries	5.3	4.1	5.8	4.9	3.7	4.8
Selected Asian countries	3.0	3.5	6.4	n.a.	n.a.	n.a.
Deutsche mark						
Industrial countries	9.4	12.9	20.6	16.4	-	-
Developing countries	15.4	8.8	11.7	11.8	-	-
Selected Asian countries	20.6	14.6	15.2	n.a.	-	-
ECUs or Euro						
Industrial countries	29.0	20.6	15.0	14.1	16.1	20.9
Developing countries	0.0	0.0	0.0	0.0	19.9	29.2
Selected Asian countries	0.0	0.0	0.0	n.a.	n.a.	n.a.
Swiss franc						
Industrial countries	1.1	1.2	1.1	0.2	0.1	0.1
Developing countries	4.8	2.6	2.2	2.0	0.4	0.2
Selected Asian countries	10.6	4.9	3.0	n.a.	n.a.	n.a.
French franc						
Industrial countries	0.0	0.4	1.1	2.1	-	-
Developing countries	2.6	1.7	2.1	2.1	-	-
Selected Asian countries	0.6	0.6	0.5	n.a.	-	-
Netherlands guilder						
Industrial countries	0.4	0.6	1.1	0.2	-	-
Developing countries	1.3	0.9	1.0	0.9	-	-
Selected Asian countries	2.8	1.9	0.9	n.a.	-	-
other currencies						
Industrial countries	3.2	0.7	4.0	5.3	1.4	2.0
Developing countries	7.6	20.8	9.9	8.3	1.7	1.6
Selected Asian countries	0.0	0.0	0.0	n.a.	n.a.	n.a.

Sources) Except for selected Asian countries, IMF annual report. For selected Asian countries, Tavlas and Ozeki (1991).

Table 3. Major Foreign Holders of U.S. Treasury Securities

billions of dollars

	2000	2001	2002	2003	2004	2005
Japan	317.7	317.9	378.1	550.8	689.9	671
China	60.3	78.6	118.4	159	222.9	310.9
Korea	29.6	32.8	38	63.1	55	68.9
Taiwan	33.4	35.3	37.4	50.9	67.9	68.1
Hong Kon	38.6	47.7	47.5	50	45.1	40.3
Singapore	27.9	20	17.8	21.2	30.4	33
Thailand	13.8	15.7	17.2	11.7	12.5	16.1

Source) http://www.ustreas.gov/tic/mfhhis01.txt.
Note) All data are those in the end of December..

Table 4. Trade Balances of East Asian Economies

Unit = million U.S. dollar

	China			Korea			Singapore			Hong Kong		
	Total	U.S.A.	Non-U.S.	Total	U.S.A.	Non-U.S.	Total	U.S.A.	Non-U.S.	Total	U.S.A.	Non-U.S.
1995	16829	8621	8208	-9788	-6223	-3565	-6207	2851	-9058	-19218	22969	-42187
1996	12144	10552	1592	-19844	-11529	-8315	-6567	1512	-8079	-18025	22711	-40736
1997	40754	16454	24300	-8437	-8390	-47	-7238	737	-7975	-20753	24749	-45502
1998	43359	21004	22355	39333	2653	36680	8280	3073	5207	-10909	26933	-37842
1999	29213	22514	6699	23907	4657	19250	3659	3033	626	-5857	28782	-34639
2000	24021	29786	-5765	11347	8520	2827	3302	3621	-319	-11329	32585	-43914
2001	23131	28174	-5043	8740	8927	-187	5699	-404	6103	-11627	28927	-40554
2002	30271	42813	-12542	9357	9832	-475	8605	2501	6104	-7784	31056	-38840
2003	25414	58694	-33280	13926	9434	4492	16125	2567	13558	-8671	28996	-37667
2004	31810	80382	-48572	28666	14108	14558	16491	2538	13953	-12132	29464	-41596

	Thailand			Indonesia			Malaysia			Philippines		
	Total	U.S.A.	Non-U.S.	Total	U.S.A.	Non-U.S.	Total	U.S.A.	Non-U.S.	Total	U.S.A.	Non-U.S.
1995	-16492	1571	-18063	3757	1897	1860	-3892	2656	-6548	-10911	992	-11903
1996	-17593	786	-18379	6950	1735	5215	-176	2102	-2278	-11213	723	-11936
1997	-5357	2484	-7841	9163	2048	7115	-1513	1338	-2851	-19923	1646	-21569
1998	11381	6122	5259	21506	3523	17983	15151	4441	10710	-30	3584	-3614
1999	8141	6224	1917	24652	4067	20585	19058	7119	11939	4735	4127	608
2000	7038	7415	-377	28591	5096	23495	15958	6494	9464	3714	4993	-1279
2001	3055	6048	-2993	25343	4551	20792	14846	5977	8869	-910	2582	-3492
2002	4130	7325	-3195	25859	4926	20933	13880	5727	8153	-221	1402	-1623
2003	4525	6484	-1959	28451	4684	23767	22240	7689	14551	-1275	-132	-1143
2004	2055	8226	-6171	25025	5551	19474	22213	8486	13727	-4365	-1067	-3298

Sources: IMF, Direction of Trade Statistics Yearbook, various issues.

Table 5. The Balassa-Samulelson Regression: The U.S.A. as benchmark

	dependent variable $\log P_j/P_{U.S.}$		
constant	-0.0872	-0.0583	-0.0600
	(-3.73)	(-2.63)	(-2.72)
$\log Y_j/Y_{U.S.}$	0.3659	0.3668	0.3658
	(34.52)	(36.81)	(36.85)
post-crisis dummy	-0.0567	-0.0582	-0.0559
	(-2.06)	(-2.25)	(-2.17)
post-crisis East Asian dummy	-0.2944	-0.26	-0.1537
	(-2.65)	(-2.47)	(-1.40)
China dummy		-0.4841	-0.5049
		(-3.88)	(-4.06)
East Europe dummy		-0.9122	-0.9129
		(-12.70)	(-12.77)
post-crisis Indonesia dummy			-0.8467
			(-3.46)
adj.R-squared	0.4812	0.5425	0.5463

Notes

1) The post-crisis dummy takes one for all countries from 1998 to 2000 and zero otherwise.

2) The post-crisis East Asian dummy takes one for eight Asian countries from 1999 to 2000 and zero otherwise.

3) The China dummy takes one for China for all periods and zero otherwise.

4) The East Europe dummy takes one for three countries (Belarus, Romania, and Ukraine) for all periods and zero otherwise.

5) Number of observations is 1298 (11 periods for 118 countries) for each regression.

6) t-statistics are in parentheses.

Table 6. The Balassa-Samulelson Regression: Germany and Japan. as benchmarks

(1) The case where Germany is a benchmark country

	dependent variable $\log P_j/P_G$		
constant	-0.4499	-0.4212	-0.4226
	(-21.31)	(-21.11)	(-21.27)
$\log Y_j/Y_G$	0.3664	0.3672	0.3661
	(34.45)	(36.69)	(36.73)
post-crisis dummy	0.0983	0.0967	0.0992
	(3.57)	(3.73)	(3.84)
post-crisis asian dummy	-0.2531	-0.2179	-0.1079
	(-2.27)	(-2.06)	(-0.98)
China dummy		-0.4911	-0.5126
		(-3.92)	(-4.10)
East Europe dummy		-0.9118	-0.9125
		(-12.64)	(-12.71)
post-crisis Indonesia dummy			-0.8753
			(-3.56)
adj.R-squared	0.4800	0.5410	0.5451

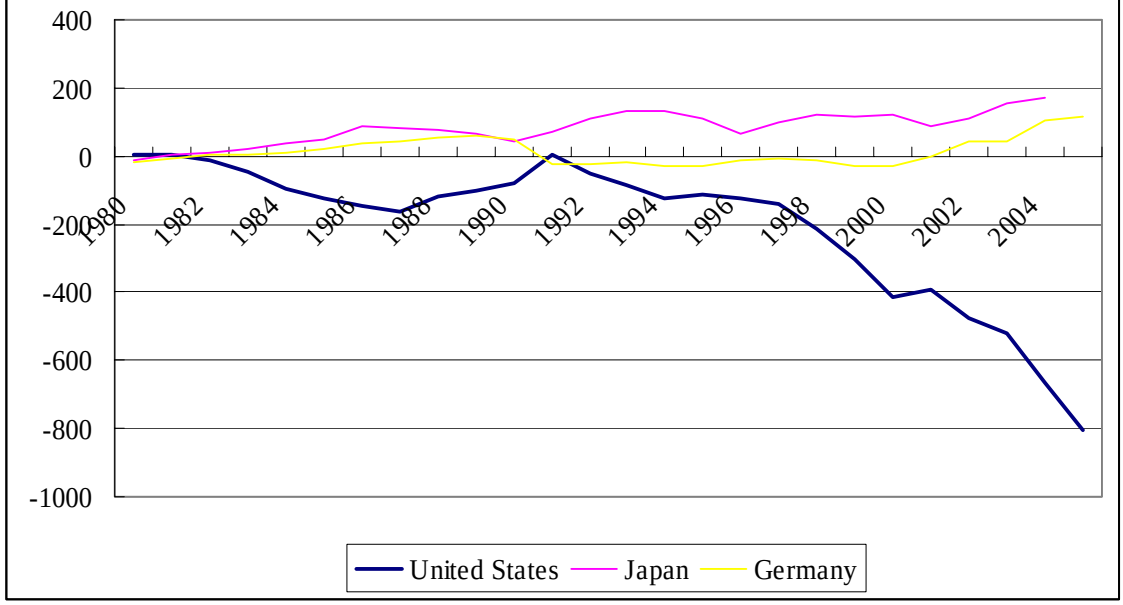
(2) The case where Japan is a benchmark country

	dependent variable $\log P_j/P_J$		
constant	-0.5594	-0.5306	-0.5321
	(-24.52)	(-24.51)	(-24.66)
$\log Y_j/Y_J$	0.3664	0.3673	0.3663
	(33.39)	(35.42)	(35.43)
post-crisis dummy	-0.0078	-0.0094	-0.0070
	(-0.27)	(-0.35)	(-0.26)
post-crisis asian dummy	-0.3441	-0.3109	-0.2089
	(-2.99)	(-2.83)	(-1.83)
China dummy		-0.4752	-0.4951
		(-3.66)	(-3.82)
East Europe dummy		-0.9129	-0.9135
		(-12.22)	(-12.27)
post-crisis Indonesia dummy			-0.8118
			(-3.18)
adj.R-squared	0.4621	0.5212	0.5245

Notes 1) The definition of the dummy variables are the same as those in Table 5.

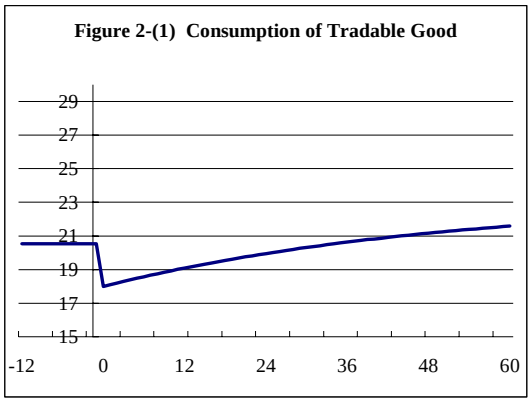
2) t-statistics are in parentheses.

Figure 1. Current Account Balances of the U.S.A., Japan, and Germany



Data Source) International Financial Statistics, IMF.

Figure 2. Impacts of a Preference Shock on Consumption and Exchange Rate



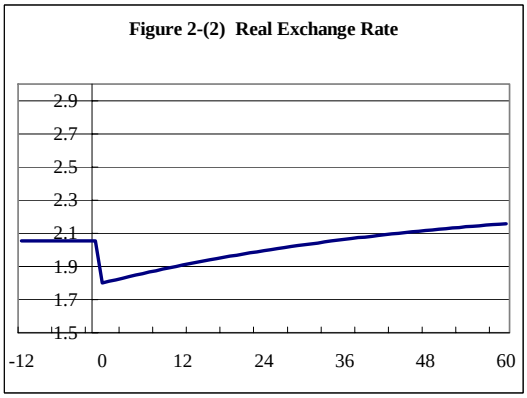
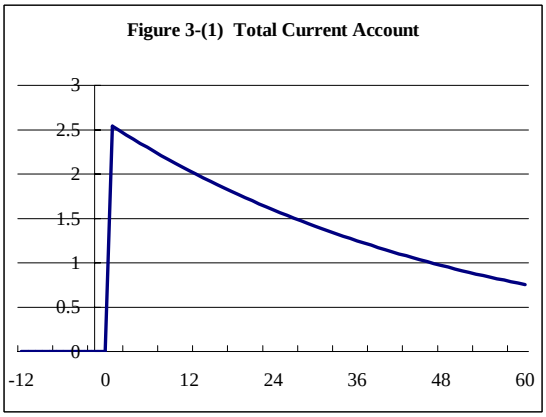
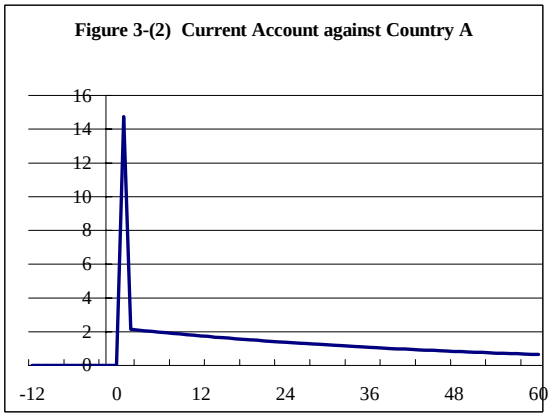


Figure 3. Impacts of a Preference Shock on Current Accounts





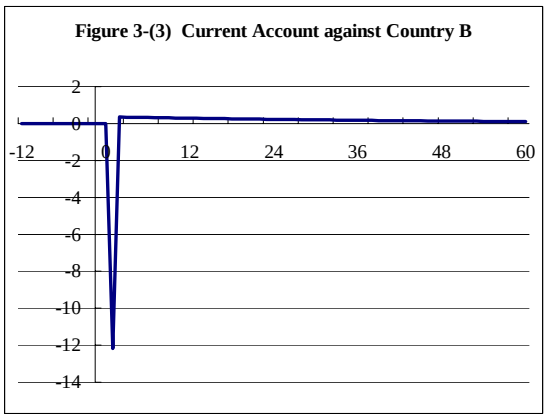
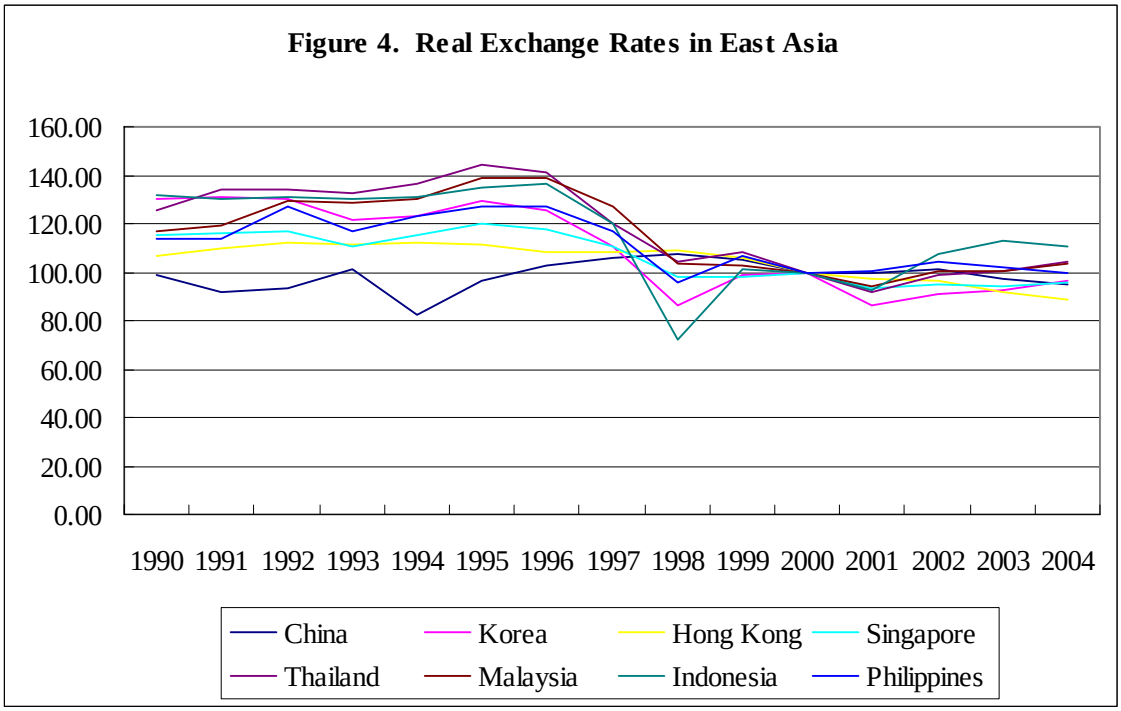


Figure 4. Real Exchange Rates in East Asia



Sources) International Financial Statistics, IMF。

Note 1) All real exchange rates are normalized to be 100 in 2000.

2) "Real Exchange Rate" of country c in year y $= \left\lfloor p_{c,y} \times \left(e_y / e_{2000}\right) \times 100 \right\rfloor / p_{USA,y}$

where e = nominal exchange rate (dollar per national currency), p = except for China, Producer Price Index (for China, Consumer Price Index)